

## TRACTOR GRILLE AND GRILLE GUARD

### Technical Field of the Invention

This invention pertains generally to a tractor, such as a tractor equipped  
5 with a loader having a bucket, and particularly to a grille for the tractor and to a grille guard.

### Background of the Invention

When a tractor is equipped with a loader having a bucket, debris falling  
10 from the bucket can damage the cooling system of the tractor unless the tractor is equipped with a grille, which protects the cooling system of the tractor. Sometimes, debris falling from the bucket can damage the grille, unless the tractor also is equipped with a guard for the grille.

In a tractor equipped with a loader having a bucket, the radiator and  
15 engine compartment of the tractor should allow the operator to have good lines of sight to the top and sides of the bucket and should allow ground and loader clearances that are adequate. If provided, a grille to protect the radiator and a guard to protect the grille should not interfere with such lines of sight and should not reduce ground or loader clearances.

20 Prior grilles and grille guards for tractors are exemplified in United States Patent No. 3,622,174 and United States Patent No. 3,949,889.

### Summary of the Invention

According to a first aspect of this invention, a tractor having a frame,  
25 which has a front portion, is provided with a grille having a hollow frame. The

hollow frame of the grille has a lower portion. The grille is fastened to the front portion of the frame of a tractor only at the lower portion of the hollow frame of the grille.

Preferably, the frame of the grille is molded, as by rotational molding,  
5 from a polymeric material, for which cross-linked polyethylene is preferred. Preferably, the hollow frame is a three-sided, three-dimensional space frame, each side of which is formed by hollow frame members.

According to a second aspect of this invention, a combination of a grille,  
a bracket, and a grille guard is provided in a tractor having a frame, which has  
10 a front portion. The grille has a frame fastened to the front portion of the frame of the tractor. The bracket is mounted, as by welding, to the front portion of the frame of the tractor. The bracket projects frontwardly, through an aperture in the frame of the grille. The grille guard is fastened to the bracket, in front of the grille.

15 Preferably, the aperture, through which the bracket projects, is located in a lower portion of the frame of the grille. Preferably, the bracket is one of a pair of brackets, each of which is employed similarly.

Preferably, in a combination according to the second aspect of this  
invention, a grille according to the first aspect of this invention is employed,  
20 along with a grille guard, as described above.

These and other objects, features, and advantages of this invention are evident from the following description of a preferred embodiment of this invention, with reference to the accompanying drawings.

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### **Brief Description of the Drawings**

Figure 1 is a fragmentary, perspective view of a front portion of a tractor equipped with a novel combination of a grille having a hollow frame, a pair of brackets, and a grille guard. Being outside the scope of this invention, other  
5 elements of the tractor are not shown.

Figure 2 is a fragmentary, exploded, perspective view, which is similar in many respects to Figure 1, except that the grille guard is separated.

Figure 3 is a fragmentary, exploded, perspective view, which is similar in many respects to Figure 2, except that the grille also is separated.

10 Figure 4, on an enlarged scale, is a cross-sectional detail taken along line 4--4 in Figure 3, in a direction indicated by arrows.

### **Detailed Description of the Preferred Embodiment**

While the present invention is susceptible of embodiment in various  
15 forms, there is shown in the drawings, and will hereinafter be described, a presently preferred embodiment, with the understanding that the present disclosure is to be considered as an exemplification of the invention, and is not intended to limit the invention to the specific embodiment illustrated.

As shown in Figures 1-3, a tractor 10 having a steel frame 12, an engine  
20 compartment 14 mounted onto the steel frame 12, and a hood 16 hinged to the engine compartment 14 at a rear portion of the hood 16 is equipped with a novel combination of a grille 20, a pair of brackets 40, and a grille guard 60. The engine compartment 14 and the hood 16 enclose a cooling system 17 (shown in Figure 3) of the tractor 10.

The grille 20 has a hollow frame 22, which is molded, preferably by rotational molding, from cross-linked polyethylene, which is a tough, impact-resistant material, so as to have a front window 24 and two side windows 26. The grille 20 has a corrugated wire mesh screen 23 that is mounted, via  
5 fasteners, in the front window 24. Wire mesh screens 27 are mounted, via fasteners, in the side windows 26. The hollow frame 22 has lower apertures (not shown) venting the frame 22.

The hollow frame 22 is a three-sided, three-dimensional, space frame, each side of which is formed by hollow frame members (see Figure 4 for a  
10 cross-sectional detail of one such member), which communicate internally with one another so as to enhance resiliency of the hollow frame 22. The hollow frame 22 is molded so as to have two apertures 34, each being elongate in a vertical sense, one on each side of the front window 24, and each extending through a lower portion 28 of the hollow frame 22.

15 The grille 20 is mounted to a front portion 42 of the frame 12 of the tractor 10, only at the lower portion 28 of the frame 22, via fasteners 36 beneath the front window 24 and via a fastener 38 beneath each of the side windows 26. Being molded from cross-linked polyethylene and being vented, the hollow frame 22 is resilient but has sufficient rigidity to enable the hollow  
20 frame 22 to support the grille 20, even though the grille 20 is mounted only at the lower portion 28 of the hollow frame 22.

The brackets 40, which are hook-shaped pieces of sheet steel, are welded, as shown, or mounted by fasteners (not shown) or otherwise to the front portion of the steel frame 12 of the tractor 10 so as to project frontwardly  
25 and upwardly. Each bracket 40 projects through one of the apertures 34 of the

frame 22 of the grille 20. The grille guard 60, which is disposed in front of the grille 20 is welded from sheet steel so as to have two depending legs 62, each of which fits alongside and is fastened, via fasteners 64, to one of the brackets 40.

- 5           A hood release actuator 65, shown in Figures 2 and 3, penetrates an opening in the screen 23 and is exposed for grasping and pulling from between bars of the grille guard 60.

          The grille 20 protects the cooling system of the tractor 10 and the grille guard 60 protects the grille 20. Also, if the tractor 10 is equipped with a loader 10 (not shown) having a bucket, the grille 20 and the grille guard 60 do not interfere with the operator's lines of sight to the top and sides of the bucket and do not reduce ground or loader clearances.

          From the foregoing, it will be observed that numerous modifications and variations can be effected without departing from the true spirit and scope of the novel concept of the present invention. It is to be understood that no 15 limitation with respect to the specific embodiment illustrated herein is intended or should be inferred. The disclosure is intended to cover, by the appended claims, all such modifications as fall within the scope of the claims.